

Introduction

Much of Zambia's history in controlling illegal hunting of wildlife has been directed at law enforcement. As a control measure, law enforcement is expensive and requires extensive deployment of manpower to be effective. Its record of success has been limited, and in many areas of Zambia wildlife populations continue to decline because of illegal hunting.

ADMADE was conceived as an alternative approach to conventional law enforcement that could reduce these costs by relying on community residents to protect their communal lands against this illegal use. In areas where communities are properly organized with capable leadership, ADMADE has delivered much promise to wildlife conservation in Zambia. Despite these efforts, however, the use of wire snares to trap and kill animals has become a practice adopted by many living in ADMADE areas.

'Snaring', as it is often called, is a highly destructive and efficient way of killing wildlife. It is not selective and many unwanted species are often impaled and wasted. People who use snares are usually local residents living near to where the snares are set in order to remove animals as they are caught. Snaring does not attract the attention as a gunshot does, and for this reason is more difficult to control.

In many ways, snaring can be considered a useful indicator for how well a community-based resource management (CBNRM) program, like ADMADE, works. If residents are benefiting enough from wildlife through legal revenues through a CBNRM program, then use of snares by local residents should be relatively insignificant. Despite the various efforts through ADMADE to improve living standards through the construction of such social facilities as schools, clinics and wells and to improve the protection of wildlife by locally employed village scouts, the use of snares has remained unacceptably high. Various ways are used to measure incidence of snaring but the most reliable way is from safari hunting records and the independent appraisal of safari clients after completing their hunts. In most areas in Luangwa Valley, for instance, the percentage of clients who sited snaring as a problem in their hunting area has averaged – for the past three years.

In response to this problem, the African College for CBNRM has undertaken various studies to better understand why the use of snares is high and to test appropriate interventions to reduce snaring. This paper reviews these results and offers lessons that may provide helpful solutions to CBNRM programs in dealing with this resource management problem.

Background: cause and scale of the problem

In many game management areas rural communities are unable to grow sufficient food and shortages are likely to be most acute during the months of December to March as food stocks

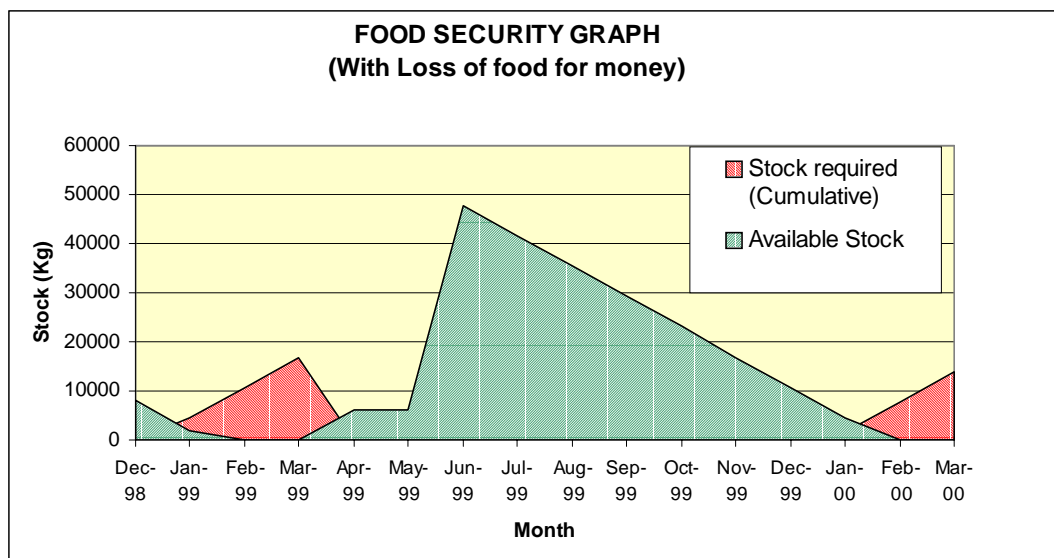
decline prior to the next season's harvest. Reasons vary but key factors include poor farming practices, animal crop damage, selling food for household income, and limited arable land. The latter reason is particularly severe in Luangwa Valley where it is estimated that less than 5% of the total GMA land area is suitable for farming. Based on an analysis of satellite images, these land areas are already fully utilized. In short, a significant number of households from these GMAs do not produce enough food to last the year. As a result, families living in areas with wildlife and affected by hunger turn to snaring as a way of securing food in exchange for game meat.

The scale of the problem can be staggering. In one GMA in Luangwa Valley having a community of 171 households, it was estimated that 22 of these households actively used snares and were responsible during one year for the loss of 2428 animals. 84% of these households said they used snares to generate income or to exchange for food. In a separate study, four GMAs in the Luangwa Valley were each found to have at least one community grouping, known as village area groups (VAGs), where important wildlife populations are found nearby but where agricultural production could not meet the requirements of the community. In each of these VAGs a relatively small number of households survive by depending almost exclusively on game meat (see Table 1) during the months of December to March with significant consequences to wildlife mortality in the area.

Table 1. Number of households most dependent on wildlife for securing food security during wet season in VAGs of key wildlife importance				
GMA	L. Lumimba	L. Lumimba	Chifunda	Chikwa
VAG Name	Lukusuzi	Yakobe	Mapamba	Kanga
Households dependent on wildlife	21	10-15	25	23
Number of animals killed per month per household	5	5-10	5	8
Estimated animals killed for food security per wet season by these households	420	336	500	736
Total households	360	232	532	160

Low food production was physically examined in Yakobe VAG (Lower Lumimba GMA) by examining household granaries at various intervals and projecting food shortfalls for this particular community (see Figure 1.). Results produced a scenario of a food shortfall for about two months in 1999, representing approximately 4050 kgs of maize. At a cost of K20,000 per 50 kg bag of maize, this shortfall represents a total cost of K1.62 million. Providing an extra margin of error of 30%, the cost for Yakobe food shortfall is K2.1 million. Including cost of transport, approximately K3.6 million would be required to meet the food security needs of this community.





Potential income that could have been earned through the sale of safari licenses for Yakobe from the estimated 336 animals killed in this same VAG (see Table 1) is many times more than the cost of the projected food relief. This is based on the likely assumption that such valuable trophy animals as lion, leopard and buffalo are also snared.

Interventions and lessons learned

The College undertook a year-long case study of Mwanya community to explore various approaches to lowering household dependence on game meat. The community was sufficiently organized according to the new ADMADE leadership structure that investigators were able to develop and test possible interventions compatible with this structure. This section examines these interventions as measures community leaders may need to take in over-coming food security problems to minimize wildlife loss.

1. Food security monitoring

Because household food stocks are stored in separate granaries, it is possible to make an accurate description of each family's food supply for the year. Such information also provides additional information:

- a. if the community is likely to have a net shortfall or surplus,
- b. which households are the better farmers
- c. which households will be most affected by famine and thus most likely to engage in snaring
- d. which farming practices produced the best yields.



In order for VAG leaders to be more pro-active in responding to problems of shortages or opportunities of food surpluses, community-based monitoring of crop yields and rate of consumption is required.

Lessons:

- a. Each VAG should establish its own food security committee with members trained in monitoring household foodstocks. Members could include people who are recognized in the community as good farmers so that their household visits can be helpful in providing advice to their fellow farmers.
- b. Results of food supply and food production monitoring should be a regular agenda item for VAG public meetings to encourage better planning of farm needs and improved public education.
- c. People who participate in the monitoring will be able to acquire much knowledge about the problems of food production in the community and will help convey this information into forums that may find solutions and thus lower risks of wildlife losses.

2. Public education

Lack of food security should be regarded as a public ‘enemy’, just as any threat to a community would be regarded. This message needs effective communication by their own local leaders, people who can be trusted and believed. Such efforts will enable more households to appreciate the destructive link between food shortages and loss of wildlife and the economic consequences to the community at large. The approach local leaders take in conducting such educational campaigns will be very critical to how well households embrace new ideas and approaches to improving food security.

Lessons:

- a. Each VAG should develop its own strategy for overcoming food shortages with support from its ADMADE revenues. This requires a well-planned participatory approach to promote community support; otherwise, results will likely be disappointing. Details for how the approach will work need to be explained and recorded and what role community members have.

An example illustrating key components of Mwanya’s food security strategy

- a) *Higher yielding farm practices will be introduced to meet VAG-level shortfalls without expanding farming area or adding further encroachment to wildlife habitats. In good farming years a net surplus will be produced for possible market sales.*
- b) *Until this can be achieved, VAGs will commit funds to purchase food shortfalls from other sources.*



- c) *A new cassava variety will be introduced to provide additional security for severe drought situations.*
 - d) *Electric fencing will be used to protect granaries from elephant and buffalo by consolidating household granaries into a communal area enclosed with electric fencing. Within the fencing perimeter additional food production activities will be initiated to add value to electric fencing through income generating activities. In particular, drip irrigation technology will be developed to start vegetable gardens and fruit tree orchards.*
 - e) *Selling of maize, rice or sorghum will be supported by the CRB to enable local food reserves to be stored within the community and later resold during famine months. This will reduce the flow of food out of the GMA, which is one of the causes of famine. To maintain a local food reserve, proper food storage facilities will have to be constructed.*
- b. VAG committee members should review the safari hunting records, most especially the safari client questionnaires, and assess the level of snaring and poaching in the unit that might be originating in their own VAG. At public meetings present the economic losses to the community that illegal hunting is causing.
 - c. Food security committee should encourage their own meetings of interested people in the community to learn more about ways to improve crop yield. Such meetings will likely identify ways ADMADE funds could be used to support food security needs. The food security committee will become an important pressure group at VAG meetings to keep this topic an important issue.

3. Food purchasing

When food shortages occur, shortfalls will normally have to be made up for by food purchases sufficient to last until next year's harvests. Depending on the scale of the purchase, the entire exercise can be extremely problematic if not well planned. Communities need skills in such planning and should develop experience in undertaking such exercises to avoid serious loss of wildlife when shortages do occur.

Lessons:

- a. Purchasing food from outside the CRB community will be at least several times more expensive than purchasing the inputs to produce the same amount of food locally. Unless food shortfalls can be purchased and supplied more cheaply from within the CRB community, it will always be cheaper and easier to support improved farming practices.
- b. Some VAGs may have better soils than other VAGs and with improved farming practices could produce a surplus for sell to VAGs where farming is constrained by soils or wildlife.
- c. Even within a VAG, there may be a surplus among individual households and VAG funds could be used to bulk store them to meet projected short-falls for specific families within the community.



- d. There are many logistics involved in purchasing and delivering purchased food to a VAG: securing transport, loading and off-loading, having sufficient bags if locally purchased, road improvement for delivering food to the VAG, and so forth. A detailed plan is needed that has full support of the community so that delegation of responsibilities is clear and time-consuming arguments are avoided. Implementing a community plan to purchase food relief may require a full-time salaried supervisor.
- e. The greatest threat to a food relief exercise is lack of transport to deliver the food. VAG and CRB leaders will need to consult closely with all possible sources of transport, including local safari operators, and to make arrangements for this hiring or loan of these sources well in advance.

4. Food sharing and household assistance

Agreeing on how purchased food relief for the community will be shared is a crucial test for demonstrating the value of wildlife to VAG members. As previously stated, a common approach used by many households in meeting food needs is by snaring and exchanging game meat for food. The ADMADE approach, therefore, should show that wildlife legally utilized can achieve the same result with less cost. Reduction of effort and risk in terms of setting and visiting snares can be thought of as a cost saved, but unless families can afford the food relief provided by ADMADE, households will still be forced to snare.

Lessons

- a. The purpose of food relief is not to generate income but to reduce food shortfalls that might cost the community more money in terms of lost revenues from wildlife license sales.
- b. Food relief purchased with VAG funds should be resold to the community at a subsidized cost to ensure the purchase cost is well below the commercial value. In this way, households can appreciate how their wildlife resources are lowering living costs and improving living standards through increased food security.
- c. Families unable to pay this subsidized cost should be given opportunities to perform public services in exchange for free food.
- d. Food relief exercises are also a useful opportunity to remove wires from the community by offering households free maize in exchange for a fixed number of wire snares. Such wires once surrendered should be destroyed in public as a symbol of community commitment to producing more wildlife.
- e. All food distribution should be fully accounted for with written records. Members of the CDC and the Food Security Sub-committee would be appropriate people to supervise this exercise.
- f. Food should only be distributed during those months when food shortages are likely to occur as based on results of food monitoring.



5. Food production

For most VAGs the ultimate objective of food security is to be self-sufficient in food production. Wildlife is considered a cash crop just as any other crop grown for commercial value, but unlike other agricultural type crops, wildlife does require extra labor cost to the community. For this reason, if VAGs can achieve self-sufficiency in food production, then they will be able to benefit more fully from wildlife as a second crop.

To enhance the commercial value of wildlife to the community, farming practices should result in higher yields per unit area than is currently the case. This will lessen the potential conflict between wildlife and the need for more farm land. The farming concept ADMADE promotes in achieving this objective is conservation farming, which depends on fertilizer but reduces fertilizer run-off. It also supports higher retention of rain fed water, incorporates plant litter for soil improvement, and ultimately uses agroforestry to reduce dependence on fertilizer use.

There are problems encountered when introducing this approach to a community without much prior training in new farming practices. For one, most households are unable to assume personal financial risks for farming inputs to support this approach. People are also generally reluctant to change old farming practices without examples to follow that show positive results. In addition, a number of households are not committed to farming and these are often the households who depend on snaring.

Lessons:

- a. Prior public education about the importance of food security and the approaches that can best achieve this security require public debate and consensus on whether the VAG should commit financial resources for this purpose.
- b. Assuming that it does, introducing conservation farming may require a pilot training site that can be regarded as a community garden. The food-security sub-committee should be responsible for developing the costs, siting the plot, demarcating its size, soliciting community participation, and agreeing on amount of community funds to commit.
- c. A pre-requisite to establishing a communal garden is to have its leaders undergo training in the methodologies of conservation farming. ADMADE has promoted the idea of having training sites scattered throughout ADMADE areas so that local farmers will find it more convenient to attend trainings.
- d. Communal garden labor could be paid for in kind with maize purchased for food security for that year. Otherwise cash incentives will likely have to be provided. If people who have low food stocks or who are known to be setting snares are encouraged to participate with these food or monetary rewards, two benefits will be achieved. They will contribute labor while learning a farming skill and they will have less need to set snares.



- e. Once the benefits of conservation farming are well demonstrated and it is clear a growing number of households wish to adopt the approach for their own gardens, VAG leadership should initiate dialogue with the community to establish a depot of farming inputs for sale to residents. Again, the resale value could be subsidized or given partially on credit. The VAG may consider contracts with individual farmers to repay the loan with maize rather than cash to help build a food reserve within the VAG or to supply village scouts with food for their patrols.
- f. Good farming practices that help achieve food security will increase the economic returns from wildlife as a renewable cash crop by increasing wildlife production.

6. Food marketing

As mentioned previously, studies have suggested two primary reasons for snaring: hunger and need for income. Food is a commodity that households with an income can purchase, and CRB responsibilities for the management of the resource requires that it also purchases food in bulk to support its staff of village scouts. Creating markets for food is an important way of sustaining interest in good farming practices while also reducing the threat of illegal hunting.

Lessons:

- a. CRB leadership should encourage use of ADMADE revenues to support markets for household farm surplus. Possible markets might include a food reserve for each VAG or one at some central location to help reduce hunger in the community, selling food to the staff of tourist camps, and providing patrol rations to the wildlife camps.
- b. If a food reserve is to be established, training of appropriate personnel in techniques of storage, stores management, and business administration will be needed to ensure stocks are accounted for and managed cost-effectively as a community enterprise.
- c. Another way ADMADE revenues could stimulate marketing opportunities for households in farm products is to offer credit to small business groups seeking to commercialize products from their produce. Examples might include support for a woman's group to buy an oil press to make and sell cooking oil, initial inputs to start a commercial vegetable garden, and veterinary supplies that could be locally sold to protect poultry from Newcastle's disease.

7. Reducing food loss from wildlife destruction

Loss of crops due to wildlife can be disastrous for the affected households and can increase the risks of food shortages for a community. There are growing trends in the Luangwa Valley, for instance, of elephants raiding granaries during night hours. If left undefended, the granaries can be emptied, leaving the owners with serious problems of starvation for months to come. During the early stages of seed germination, hippos and other species seek the tender shoots of maize and families spend sleepless nights guarding their crops during the period. Introducing ways that will reduce such food losses provides increased security for investments



a farmer may wish to make in his/her field and will likely encourage improved farming practices in a community.

Lessons:

- a. One approach to reducing crop damage or granary damage from wildlife is to use solar powered electric fencing. The application and use of this technology is manageable at the community.
- b. The initial capital to finance this fencing is prohibitive at a household level but become more affordable per household if the investment is shared as a VAG project.
- c. Consolidating household granaries within the perimeter of an electric fencing would also allow other uses to be developed that could add value to the electric fencing investment. For example, community vegetable gardens and fruit orchards could be established, especially if a source of water were nearby. In addition, the fencing could be used to grow and protect the seedlings of agroforestry seedlings prior to transplanting them.
- d. The value of the equipment increases the likelihood that the equipment will be stolen. Participating farmers will therefore need to find ways the equipment can be guarded against theft.
- e. The community could also hire registered firearm owners in the community to police gardens from wildlife pests. This procedure should not encourage the use of privately owned guns to kill animals for meat, as this would encourage crops to be used as baits to attract animals for control hunting.
- f. The VAG leadership should approve siting future farms or planning extensions of existing ones, most especially by members of the RMC. This would reduce chances of locating gardens at sites traditionally used by animals as a transit point or feeding ground, thus reducing farmer-wildlife conflicts in the community.
- g. Depending on the severity and scale of crop loss from wildlife, the VAG food security sub-committee should be able to seek village scout assistance through its RMC to patrol their gardens during periods of peak crop raiding.

Discussion

All of the above ideas and methods are under some form of pilot testing in ADMADE areas of the Luangwa Valley, but most especially in Mwanya area, through the monitoring and technical support services of the African College for CBNRM. Results thus far have revealed a certain difficulty in communities to organize civic action, as most people seem more concerned about their own needs than helping solve problems the community at large may be facing. This is an indication that civic understanding is poorly developed and that most people do not fully recognize that failing to work cooperatively as a community to achieve food-security is to the detriment of household benefits under ADMADE.

In introducing food security as a VAG-supported community project, much effort is therefore required to facilitate this understanding if food security efforts are to succeed. While external



facilitators and extension officers are critical to jump-starting the process, committed local leadership is critical. One recommendation in developing such leadership is the creation of a local food security sub-committee, consisting of experienced and interested farmers as well as people concerned by crop losses from wildlife. The sub-committee might be composed of members of the CDC, RMC and other interested and knowledgeable people and would provide technical stewardship in promoting food security methodologies. It would also act as a pressure group to help advocate use of VAG funds for achieving food security in the community.

Despite some of the teething problems in initiating food security concepts and activities, there has been much enthusiasm in adopting them in most VAGs. In two units where most of the work was carried out, four out of seven VAGs welcomed the new ideas and participated positively in their introduction. Food security for these VAGs have become a community cause that has helped to better organize ADMADE leadership and define the roles and responsibilities of its leaders. Unlike capital projects, which ADMADE in the past mostly funded to support social service needs, food security is an activity that involves many people. Furthermore, it helps to bring community residents together to relate their efforts and plans to the ultimate objective of increasing wildlife production and developing this resource as a cash crop through the ADMADE policy.

The lessons outlined in this paper provide a set of food security approaches that fit well within the ADMADE leadership structure. For this reason the efforts now being undertaken to apply these approaches will provide an exciting test for CBNRM commitment to conserve natural resource through appropriate community development approaches. The key to this test will be making good investments of wildlife revenues and supervising these investments with effective and honest leadership. The African College for CBNRM will remain a close partner to these efforts to provide facilitation and a critical review of these methodologies for possible application elsewhere in the country.

Acknowledgements

This paper is a contribution by the African College for Community-based Natural Resource Management. Support for this paper was provided by USAID and Wildlife Conservation Society of the Bronx Zoo. Members of staff at the College, including Edwin Matokwani, Phillip Ngulube, Andrew Phiti, William Banda and Josius Zulu, contributed extensively to the development of this paper.

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